

## FOUR CRAB SPIDERS OF THE FAMILY THOMISIDAE (ARANEAE, THOMISIDAE) FROM YUNNAN, CHINA

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**Abstract** The present paper deals with 4 crab spiders of the family Thomisidae collected from Gaoligong Mountains, Yunnan Province, China. Including are: 1 new to science (*Oxytate clavulata* Tang, Yin et Peng, sp. nov.) and 3 new to China (*Oxytate bhutania* Ono, 2001; *Loxobates minor* Ono, 2001; *Synema nangoku* Ono, 2002). The female of *Loxobates minor* Ono, 2001 is described here for the first time.

**Key words** Thomisidae, new species, new record, taxonomy, Gaoligong Mountains, China.

Thomisidae are a large spider family including 171 genera and 2 070 species in the world (Platnick, 2008). Crab spiders are small to large with body size 1.8–23.0 mm and inhabit in flowers, grasses, shrubs, tree foliage and leaf litter.

Up to now, a total of 22 species of the genus *Oxytate* were recorded from Africa, Australia and the Oriental realm, most of which were reported from South East Asia. 7 species of the genus *Oxytate* were recorded from China. A total of 10 species of the genus *Loxobates* were recorded worldwide, only the species: *L. daitoensis* Ono, 1988 reported from China. We consider *L. spiniformis* Yang, Zhu & Song, 2006 should belong to subfamily Thomisinae for its undeveloped claw tufts. The general appearance also differs greatly from that of *Loxobates* (carapace flat, ocular area wide versus carapace swollen and ocular area compact in *Loxobates*). More than 100 species of the genus *Synema* recorded worldwide, of which only 5 species reported from China (Ono, 1988, 2001, 2002; Platnick, 2008; Song & Zhu, 1997; Yang, Zhu & Song, 2006).

The Gaoligong Mountains of Yunnan Province, which lies in the South West of China, is one of biodiversity hotspot of the world. About 20 new crab spiders had been reported from this region recently (Tang *et al.*, 2006; Yang *et al.*, 2006; Tang *et al.*, 2007; in press). While examining the thomisid specimens from the joint biodiversity survey conducted by CAS and HNU from 1998–2006 in Gaoligong Mountains, 4 interesting crab spiders of 3 genera are found and described here.

Type specimens will be deposited in the College of Life Sciences, Hunan Normal University, China (HNU) and the California Academy of Sciences, USA (CAS). Specimens were examined with an Olympus SZ11 dissecting stereomicroscope. Photos were taken by the

Syncroscopy Auto Montage<sup>®</sup> software with a Leica M420 stereomicroscope. Measurements of leg lengths are given as: total length (femur, patella + tibia, metatarsus, tarsus). Left structures (e. g., palp, legs and chelicerae) are measured and described. Measurements are given in millimeters (mm).

The abbreviations used in this paper are as follows: AER= anterior eye row; ALE= anterior lateral eyes; AME= anterior median eyes; E= embolus; MOA= median ocular area; PER= posterior eye row; PLE= posterior lateral eyes; PME= posterior median eyes; RTA= retrolateral tibial apophysis; VTA= ventral tibial apophysis.

### Subfamily Dictinae Simon, 1895

#### Genus *Oxytate* L. Koch, 1878

*Oxytate clavulata* Tang, Yin et Peng, sp. nov.  
(Figs. 1–5)

Type Material. Holotype ♂ (HNU-YHY2601), Yunnan Province, Tengchong County, Shangyin Township, Dashaoping Village (25.6°N, 98.4°E; alt. 2 040 m), 4 June 2006, YIN Chang-Min, HU Jia-Fang and YANG Xiao-Hua leg.

Etymology. The specific name is derived from the Latin *clavulatus*, meaning small stick-shaped, referring to the shaped of the embolus.

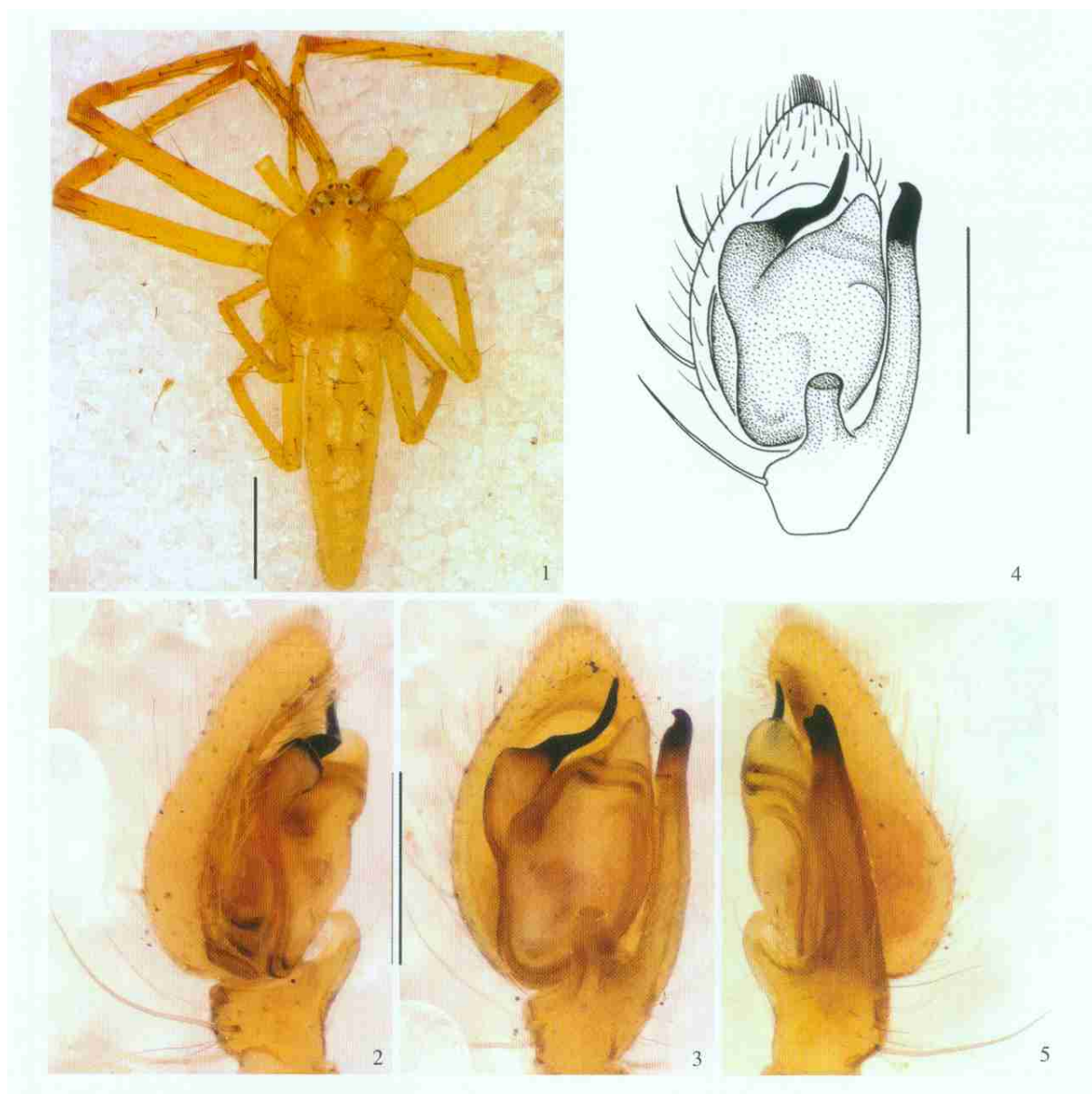
Diagnosis. This new species is similar to *O. parallela* (Simon, 1880), but can be separated from the latter by: 1) the distal of the RTA curved inwards while that of the latter curved ventrally; 2) the embolus with a basal hump absent in the latter.

Description of male. Holotype total length 4.73. Carapace 1.86 long, 1.68 wide; abdomen 3.02 long, 0.93 wide. Carapace flat, yellow. Eyes small, eye tubercles grayish white. Eye sizes and interdistances:

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Figs 1-5. *Oxytate davulata* Tang, Yin & Peng, sp. nov. 1. Male body, dorsal view. 2-5. Male palp (2. Prolateral. 3 4. Ventral. 5. Retrolateral view). Scale bars: 1= 1.0, 2-5= 0.1.

ALE 0.07, PLE 0.08, AME 0.07, PME 0.06. AME-AME 0.13, AME-ALE 0.08, PME-PME 0.16, PME-PL 0.19; MOA long 0.26, front width 0.25, back width 0.27. Sternum white, cordiform. Chelicerae, endites, labium yellow. Legs I, II light yellow, with some long spines, tibiae and metatarsi I, II with 4 pairs of long ventral spines. Legs III, IV yellow. Leg measurements: I 8.11 (2.63, 3.10, 1.68, 0.7); II 8.00 (2.60, 3.10, 1.60, 0.70); III 4.05 (1.45, 1.50, 0.70, 0.40); IV 4.17 (1.47, 1.50, 0.80, 0.40); formula 1, 2, 4, 3. Abdomen slim, dorsum light yellow with paramedian white spots. The posterior segmented, each segment with 4 short hairs. Venter slight yellow, posteriorly with gray markings. Palp with VTA and RTA, both apically sclerotized, RTA much long, apex black, bifid, and curved inboard, bulb flat, the

ejaculatory ducts visible, the basal of embolus hump like, embolus curved in thick spine shaped.

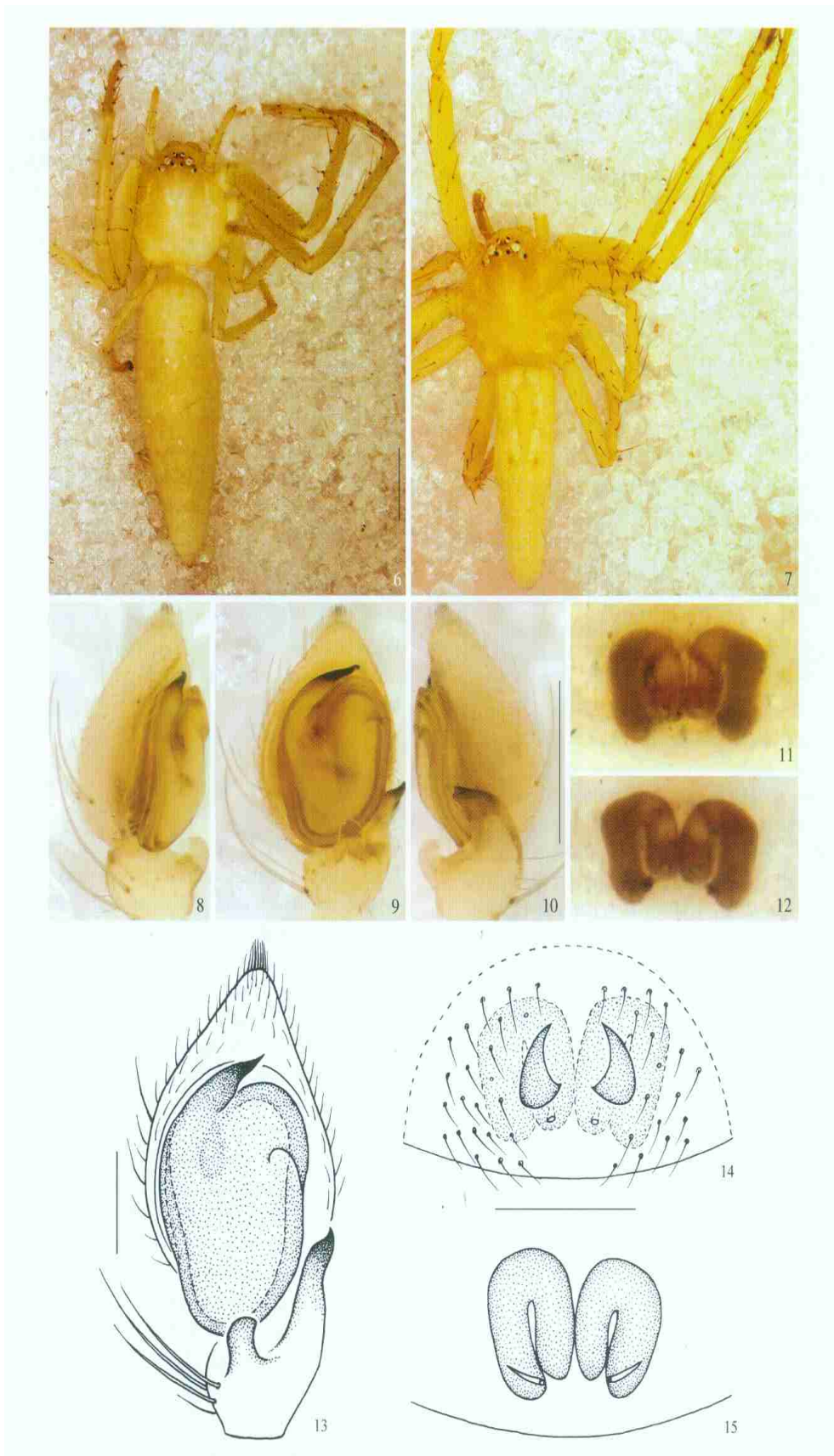
Female. Unknown.

Distribution. China (Yunnan).

*Oxytate bhutanica* **Ono, 2001** (Figs. 6-15)

*Oxytate bhutanica* Ono, 2001: 205, figs. 1-5. (types not examined).

Material examined. 1 ♀, 1 ♂ (HNU-YHY0401), Tengchong County, Jietou Township, Qiaotou Village (25.3°N, 98.4°E, alt. 1652 m), 17 May 2006; 6 ♀♀ (HNU-YHY0302), Jietou Township, Zhoujiapo (25.3°N, 98.4°E, alt. 1660 m), 16 May 2006; 1 ♂ (HNU-YHY0803), Jietou Township, Zhangjiaying Village (25.2°N, 98.3°E; alt. 1665 m), 20 May 2006; 1 ♀, 1 ♂ (CAS-YHY1506), Tengyue Township, Baofeng Temple (25°N, 98.3°E; alt.



Figs 6-15. *Oxytate bhutania* Ono, 2001. 6. Female body, dorsal view. 7. Male body, dorsal view. 8-10, 13. Male palp: (8. Prolateral. 9, 13. Ventral. 10. Retrolateral). 11, 14. Epigyne. 12, 15. Vulva. Scale bars: 6-7= 1.0, 8-15= 0.1.

1 790 m), 31 May 2006; 1 ♀ (CAS-YHY1703), Qingshui Township, Rehai (25.9°N, 98.5°E; alt. 1 470 m), 1 June 2006; 1 ♀ (CAS-YHY3801), Hehua Township, Milang (25°N, 98.2°E; alt. 1 400 m), 7 June 2006; all above specimens were collected from Tengchong County, leg. YIN Chang-Min, HU Jia-Fang and YANG Xiao-Hua. Other material examined. 1 ♀ (HNU-Tang040501), Gongshan County, Dulongjiang Township, Dizhengdang Village (28°N, 98.2°E; alt. 1 841 m), 27-30 Oct. 2004, leg. TANG Guo; 1 ♀ (HNU-Tang040605), same Township, Longyuan Village, Bailai Group (28°N, 98.2°E; alt. 1 676 m), 31 Oct. -3 Nov. 2004; leg. TANG Guo; 2 ♀♀ (CAS-DHK0501201), Lushui County, Pianma Township, Garfang (26°N, 98.6°E; alt. 1 780 m), 16 May 2005, leg. David KAVANAUGH.

Description of female. Total length: 7.60-8.10. A specimen of 8.10 measured: carapace 2.70 long, 2.50 wide; abdomen 5.60 long, 2.20 wide. Specimen light green in live and turn into pale yellow after kept in alcohol. Carapace flat. Eye sizes and interdistances: ALE 0.10, PLE 0.96, AME 0.08, PME 0.06. AME-AME 0.15, AME-ALE 0.12, PME-PME 0.20, PME-PLP 0.25; MOA long 0.20, front width 0.23, back width 0.25. Sternum white. Chelicerae, endites, labium and legs light yellow. Chelicerae without teeth. Legs light yellowish green, with some weak spines, tibiae and metatarsi I and II with 3 pairs of thick ventral spines. Tarsi with claw tufts. Leg measurements: I 11.30 (3.50, 4.30, 2.30, 1.20); II 10.60 (3.20, 4.00, 2.30, 1.10); III 6.70 (2.00, 2.50, 1.40, 0.80); IV 6.80 (2.20, 2.40, 1.40, 0.80); formula 1, 2, 4, 3. Abdomen long, light yellow. 2 pairs of muscular depressions visible. The posterior segmented, each segment with 4 hairs. Sides with yellow lines. Venter light yellow. Epigyne with a pair of guide pockets. Copulatory openings small, visible, behind the guide pockets; copulatory ducts small and short; spermathecae large "n"-shaped.

Description of male. Total length: 5.00-6.00, some specimens with small red spots on sides of abdomen. A specimen of 5.80 measured: carapace 2.00 long, 1.85 wide; abdomen 3.80 long, 1.00 wide. Abdomen narrower than in female. Eye sizes and interdistances: ALE 0.09, PLE 0.08, AME 0.06, PME 0.05. AME-AME 0.15, AME-ALE 0.10, PME-PME 0.14, PME-PLP 0.25; MOA long 0.30, front width 0.25, back width 0.26. Leg spines stronger and longer than in female. Leg measurements: I 8.90 (2.70, 3.50, 1.60, 1.10); II 7.90 (2.50, 3.00, 1.60, 0.80); III 5.00 (1.50, 1.80, 1.00, 0.70); IV 5.20 (1.60, 1.80, 1.00, 0.80); formula 1, 2, 4, 3. Palp with short VTA and long RTA, both apically sclerotized, embolus short spiniform.

Distribution. Bhutan, China (Yunnan).

### Subfamily Dietinae Simon, 1895

*Loxobates minor* Ono, 2001 (Figs. 16-28)

*Loxobates minor* Ono, 2001: 207, figs. 6-8. (type not examined).

Material examined. Yunnan Province, Tengchong County: 1 ♀, 2 ♂♂ (HNU-David065002), Qingshui Township, Rehai, Liangying Village (24.9°N, 98.4°E; alt. 1 450 m), 1 June 2006, leg. David KAVANAUGH, Roberta BRETT and DONG Da-Zhi; 6 ♀♀ (YHY1707: 3 ♀♀, HNU; 3 ♀♀, CAS), Qingshui Township, Rehai (24.9°N, 98.5°E; 1 470 m), 1 June 2006, leg. YIN Chang-Min, HU Jia-Fang and YANG Xiao-Hua; 1 ♂ (CAS-YHY2102), Hehua Township, Langpu Village (24.9°N, 98.4°E; alt. 1 150 m), 2 June 2006, leg. HU Peng.

Description of new female. Female. Total length 2.90-3.70. A specimen of 3.70 measured (HNU-David 065002): carapace 1.21 long, 1.16 wide; abdomen 2.53 long, 1.98 wide. Carapace yellow, swollen. Ocular area compact, eye tubercles brown with white rim, eye sizes and interdistances: ALE > PLE > AME > PME, AME-AME 0.11, AME-ALE 0.08, PME-PME 0.10, PME-PLP 0.16; MOA length 0.17, front width 0.17, hind width 0.16. Sternum light yellow, chelicerae, endites, labium and legs yellow. Legs with short spines, tibiae and metatarsi I, II with 5 pairs of ventral spines. Leg measurements: I 3.67 (1.15, 1.32, 0.70, 0.50), II 3.76 (1.16, 1.35, 0.75, 0.50), III 2.27 (0.75, 0.82, 0.40, 0.30), IV 2.41 (0.81, 0.90, 0.40, 0.30); formula 2, 1, 4, 3. Abdomen white, covered with a large brown marking, cardiac pattern and muscular depressions visible; sides and venter with broken white spots. Epigyne with a large sclerotized plate, under which with a central hood. Copulatory ducts small and twisted, spermathecae pyriform.

Description of male. (HNU-David065002). Total length 2.80-3.70. A specimen of 3.60 measured: carapace 1.64 long, 1.62 wide; abdomen 2.22 long, 1.28 wide. Carapace brown, darken in the margin, body color darker than in female. Leg I brown, others yellow, tibiae and metatarsi I, II with 3 pairs of short ventral spines, leg measurements: I 5.30 (1.60, 1.70, 1.10, 0.90), II 5.50 (1.65, 1.75, 1.20, 0.90), III 2.70 (0.80, 0.90, 0.50, 0.50), IV 2.90 (0.80, 1.00, 0.60, 0.50); formula 2, 1, 4, 3. Abdomen yellow, the margins with 3 pairs of red spots. Sides and venter light yellow. Palp with VTA, ITA and RTA, VTA fork-shaped, ITA small denticle like, RTA strongly sclerotized and digitiform, apically sharp.

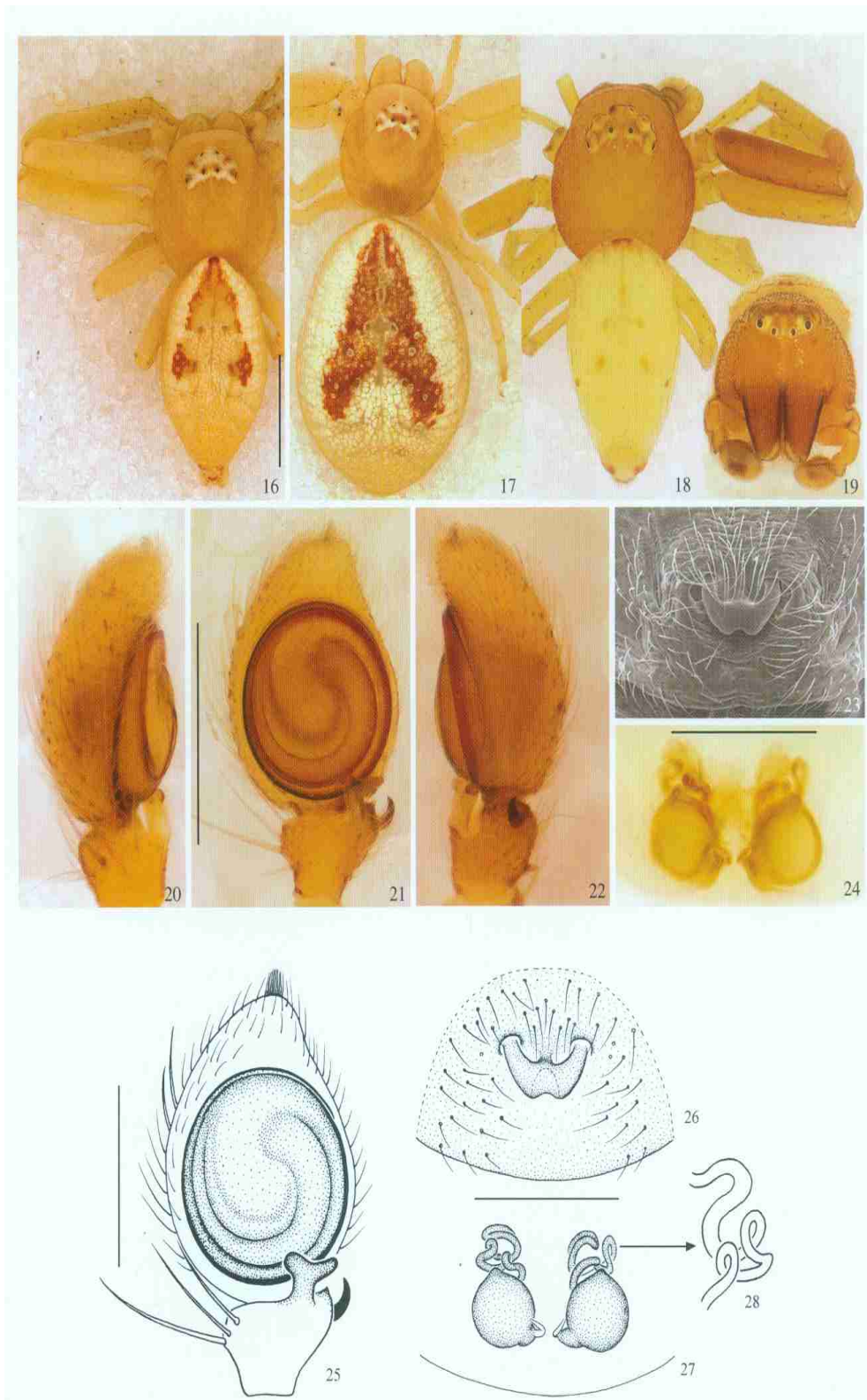
Distribution. Bhutan, China (Yunnan).

### Subfamily Thomisinae Sundevall, 1833

*Synema nangoku* Ono, 2002 (Figs. 29-33)

*Synema nangoku* Ono, 2002: 206, figs. 13-18. (types not examined).

Material examined. 1 ♀, 3 juv. (HNU

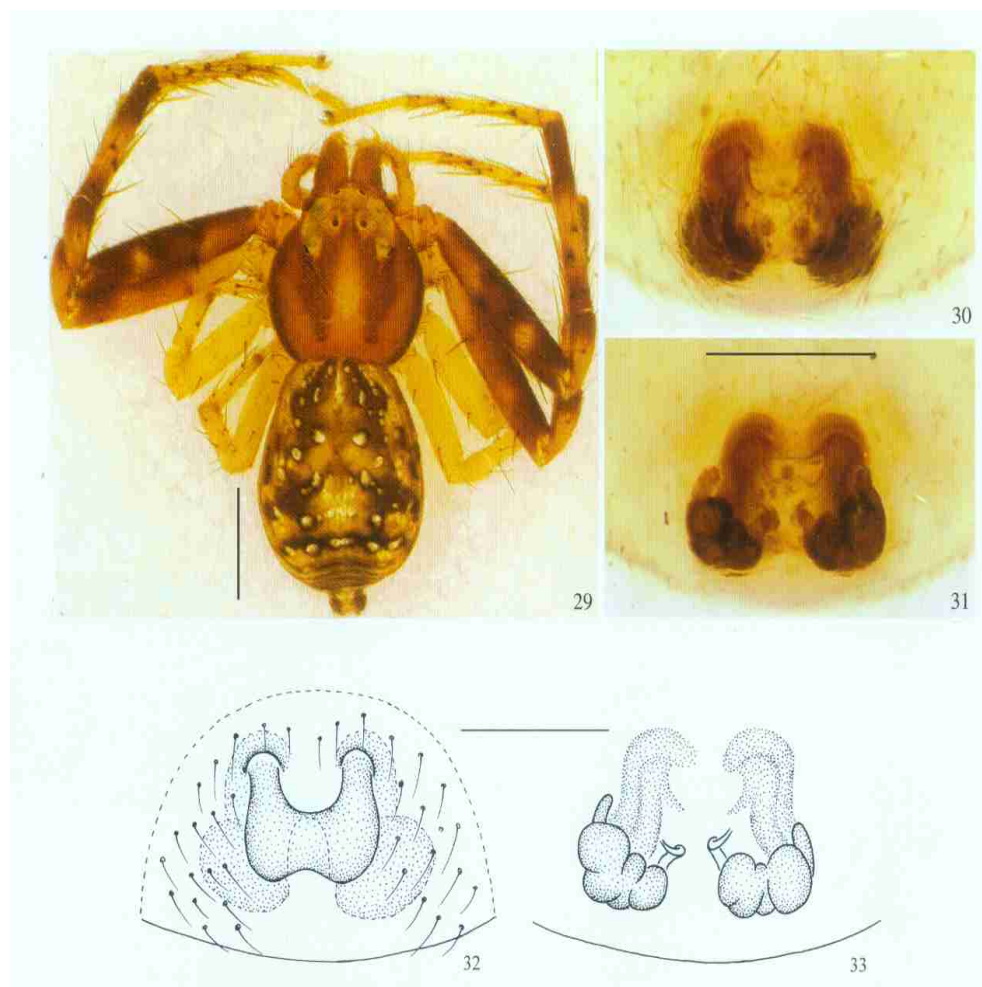


Figs 16-28. *Loxobates minor* Ono, 2001. 16-17. Female body, dorsal view. 18-19. Male body (18. Dorsal view. 19. Front view). 20-22. Male palp (20. Prolateral. 21, 25. Ventral view. 22. Retrolateral view). 23, 26. Epigyne. 24, 27. Vulva. 28. Copulatory duct, enlarged top view. E= Embdus. Scale bars: 16-19= 1.0, 20-28= 0.1.

YHY3202), Yunnan Province, Tengchong County, Manbang Township (25.1°N, 098.7°E; alt. 1300 m), 5 June 2006, leg. HU Peng.

Description of female. Female. Total length 3.60.

Carapace 1.65 long, 1.66 wide; abdomen 2.06 long, 1.76 wide. Carapace yellowish brown with a pair of paramedian blackish brown stripes, margin black. Fovea, cervical and radial grooves indistinctly. Eyes



Figs 29-33. *Synema nangoku* Ono, 2002. 29. Female body, dorsal view. 30, 32. Epigyne. 31, 33. Vulva. Scale bars: 29= 1.0; 30-33= 0.1.

small with white tubercles. Eye sizes and interdistances: ALE > PLE > PME = AME; AME-AME 0.20, AME-ALE 0.20, PME-PME 0.20, PME-PL 0.32; MOA long 0.35, front width 0.35, back width 0.37. Sternum light yellow. Chelicerae, endites, labium yellowish brown. Legs with many spines, legs I, II brown with black annuli, legs III, IV yellow, Tibiae (metatarsi) I, II with 5 (4) pairs of ventral spines. Leg measurements: I 7.18 (2.04, 2.56, 1.70, 0.88); II 6.80 (2.00, 2.40, 1.60, 0.80); III 3.94 (1.24, 1.50, 0.80, 0.40); IV 4.25 (1.30, 1.60, 0.90, 0.45); formula 1, 2, 4, 3. Abdomen yellow with some sparse grayish white spots; posteriorly with a black latitudinal stripe; sides with black lines; venter gray with yellow spots. Epigyne with a large sclerotized plate, under which with a central hood; copulatory openings lie in the anterior of sclerotized plate; spermathecae small and convoluted.

Male: Unknown.

Distribution. Japan, China (Yunnan).

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## 中国云南省四种蟹蛛 (蜘蛛目, 蟹蛛科) 记述

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**摘 要** 描述了采自中国云南省高黎贡山的4种蟹蛛: 小棒绿蟹蛛 *Oxytate clavulata* Tang, Yin et Peng, sp. nov. 和中国3新纪录种: 不丹绿蟹蛛 *Oxytate bhutanica* Ono, 2001, 小斜蟹蛛 *Loxobates minor* Ono, 2001 和南国花叶蛛 *Synema nangoku* Ono, 2002, 其中小斜蟹蛛的雌性为首次发现。

**小棒绿蟹蛛, 新种** *Oxytate clavulata* Tang, Yin et Peng, sp. nov. (图 1~5)

正模 ♂(HNU YHY2601), 云南腾冲县上营乡大蒿坪村, 2040 m, 2006-06-04, 尹长民、胡佳芳、杨效华采。

词源: 本种因触肢器的插入器呈小棒状而命名。

新种近似于平行绿蟹蛛 *O. parallela* (Simon, 1880), 但与后者区别于: 1) 触肢后侧突末端弯向内侧而后者弯向腹侧; 2) 插入器基部有一突起而后者没有。

分布: 中国云南。

**不丹绿蟹蛛** *Oxytate bhutanica* Ono, 2001 (图 6~15)

*Oxytate bhutanica* Ono, 2001: 205, figs. 1-5.

观察标本: 1♀, 1♂ (HNU YHY0401), 界头乡桥头村, 1652 m, 2006-05-17; 6♀♀ (HNU YHY0302), 界头乡周家坡, 1660 m, 2006-05-16; 1♂ (HNU YHY0803), 界头乡张家营村, 1665 m, 2006-05-20; 1♀, 1♂ (CAS YHY1506), 腾岳镇宝丰寺, 1790 m, 2006-05-31; 1♀ (CAS YHY1703), 曲石乡热海, 1470 m, 2006-06-01; 1♀ (CAS YHY3801), 荷花镇米兰, 1400 m, 2006-06-07。以上标本均由尹长民、胡佳芳和

**关键词** 蟹蛛科, 新种, 新纪录种, 分类, 高黎贡山, 中国。  
中图分类号 Q959.266

杨效华采自云南省腾冲县。其余观察标本: 1♀ (HNU Tang 040501), 贡山县独龙江乡迪政当村, 1841 m, 2004-10-27~30, 唐果采; 1♀ (HNU Tang 040605), 贡山县独龙江乡龙元村白来组, 1676 m, 2004-10-31~11-03, 唐果采; 2♀♀ (CAS DHK0501201), 泸水县片马乡岗房, 1780 m, 2005-05-16, David KAVANAUGH 采。

分布: 不丹、中国 (云南)。

**小斜蟹蛛** *Loxobates minor* Ono, 2001 (图 16~28)

*Loxobates minor* Ono, 2001: 207, figs. 6-8.

观察标本: 1♀, 2♂♂ (HNU David065002); 云南腾冲清水镇热海良盈村, 1450 m, 2006-06-01, David KAVANAUGH, Roberta BRETT 和董大志采; 6♀♀ (YHY1707: 3♀♀, HNU; 3♀♀, CAS); 云南腾冲清水镇热海, 1470 m, 2006-06-01, 尹长民、胡佳芳、杨效华采; 1♂ (CAS YHY2102), 腾冲荷花镇朗蒲村, 1150 m, 2006-06-02, 胡鹏采。

分布: 不丹、中国。

**南国花叶蛛** *Synema nangoku* Ono, 2002 (图 29~33)

*Synema nangoku* Ono, 2002: 206, figs. 13-18.

观察标本: 1♀, 3若蛛 (HNU YHY3202), 中国云南腾冲芒棒乡, 1300 m, 2006-06-05, 胡鹏采。

分布: 日本、中国 (云南)。

\* 通讯作者。